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EXAMINER

ZERVIGON, RUDY

ART UNIT PAPER NUMBER

1763

DATE MAILED: 08/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/470,446

Applicant(s)

INGLE ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,6 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6 and 9-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 3, 5, 6, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami Soichiro (JP61-37969)¹. Kawakami Soichiro describes:

- i. A gas delivery metering tube (item 23, Figure 3 - Figures 1,2) for delivering a gas (Purpose, first line), comprising:
- ii. An innermost elongated tube (item 3, Fig.1,2), said innermost tube (item 3, Fig.1,2) having two ends, a gas delivery end (lower end) that is attached (via horizontal plate supporting 3, and 1,2) to a gas supply (5, Figure 1, page 6, last paragraph of translation), and an opposite, capped end (upper end) – Figure 1 shows the innermost tube (3) as “capped” at the extreme end (upper end) opposing the gas supply, as claimed by claim 1
- iii. one or more arrays of orifices (items 13, 14, 15; Fig. 1,2) formed in each of the at least innermost (item 3, Fig.1,2) and outermost (items 2,1, Fig.1,2) nested tubes and extending along the substantial length (Figures 1,2) of each of the tubes, as claimed by claim 1
- iv. an outermost elongated tube (items 2,1, Fig.1,2), the outermost tube having two ends wherein one end (lower end) is disposed proximate to the gas delivery end (lower end) of the innermost tube (item 3, Fig.1,2), one or more arrays (13, 14; Fig.1,2) of orifices being formed in the outermost tube (items 2,1, Fig.1,2) and extending along the substantial length of the

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outermost tube, the outermost tube being disposed such that it is axially aligned with the innermost tube (Fig. 1,2), and such that an effective annular space (item 18 or 19, Figures 1,2; "buffers", Constitution) is formed between the at least one innermost (3) and the outermost (2 or 1) nested tubes, as claimed by claim 1

- v. wherein the one or more arrays of orifices formed in said innermost tube establishes a substantially uniform ("stably and uniformly", Constitution) backing pressure along substantially the length of the innermost (item 3, Fig.1,2) tube, thereby promoting substantially uniform ("stably and uniformly", Constitution) delivery of the gas (Purpose, first line) out of the orifices (items 13, 14, 15; Fig. 1,2) in the outermost (items 2,1, Fig.1,2) tube and along substantially the length of the outermost (items 2,1, Fig.1,2) tube, as claimed by claim 1 - When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).
- vi. wherein gas flowing into the innermost tube (item 3, Fig.1,2) from the gas supply is introduced into the interior of the innermost tube (item 3, Fig.1,2) at the gas delivery end, as claimed by claim 1
- vii. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the metering tube (item 23, Figure 3 - Figures 1,2) is used in a chemical vapor deposition system, as claimed by claim 6
- viii. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the nested tubes are cylindrical, as claimed by claim 9

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- ix. In combination, the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 and at least one injector assembly (item 4, Figure 1, item 6a, Fig.4) having at least one port (item 8, Figure 1, item 3a, Fig.4) for receiving the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2), as claimed by claim 11
- x. In combination, the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 and at least one shield (item 21, Figure 3) assembly having at least one plenum (inside portion of item 21, Figure 3) for receiving the gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2), as claimed by claim 12

Kawakami Soichiro does not teach the relative dimensions of Kawakami Soichiro's innermost elongated tube (item 3, Fig.1,2) and Kawakami Soichiro's outermost tube (items 2,1, Fig.1,2). As such, Kawakami Soichiro does not teach Applicant's claim 1 limitations of wherein the innermost tube (item 3, Fig.1,2) has the following properties:

$$L/D < 70$$

$$D/d \approx < 10$$

$$N_{a_{port}}/A_{tube} \approx < 1$$

Where L is the length and D is the diameter of the innermost tube (item 3, Fig.1,2), d is the diameter of one orifice in said array of orifices (items 13, 14, 15; Fig. 1,2), and A_{tube} is the area of said innermost tube (item 3, Fig.1,2); and the outermost tube (items 2,1, Fig.1,2) has the following properties:

D_{eff} and D_{in} are within a factor of three of each other

$$SurfaceArea_{outer}/NA_{outer} \approx 10 \text{ or more}$$

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wherein D_{eff} is the effective diameter of the effective annular space (items 18-20, Figures 1,2; “buffers”; Constitution), $SurfaceArea_{outer}$ is the surface area of the outermost tube (items 2,1, Fig.1,2), NA_{outer} is the total cross sectional area of all of the orifices (items 13, 14, 15; Fig. 1,2) in the outermost tube (items 2,1, Fig.1,2), and D_{in} is the inner diameter of the innermost tube (item 3, Fig.1,2) to promote substantially uniform delivery of the gas out of the orifices (items 13, 14, 15; Fig. 1,2) in the outermost tube (items 2,1, Fig.1,2) and along substantially the length of the outermost tube (items 2,1, Fig.1,2) over a range of operating conditions, as claimed by claim 1.

Kawakami Soichiro further does not teach:

- i. $D_{eff} \approx D_{in}$, as claimed by claim 3
- ii. $SurfaceArea_{outer} / NA_{outer} \approx 100$ as claimed by claim 5
- iii. The gas (Purpose, first line) delivery metering tube (item 23, Figure 3 - Figures 1,2) of claim 1 wherein the nested tubes are rectangular, as claimed by claim 10

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary either the dimensions (L,D) of the gas delivery metering tube or vary the distribution (Na_{port}) and/or the dimension ($d, A_{port/tube}$) of the orifice and/or tube dimensions, further to shape Kawakami Soichiro's tubes in rectangular form.

Motivation vary either the dimensions (L,D) of the gas delivery metering tube or vary the distribution (Na_{port}) and/or the dimension ($d, A_{port/tube}$) of the orifice and/or tube dimensions, further to shape Kawakami Soichiro's tubes in rectangular form is to delivery process gases “..supplied stably and uniformly into the anode from a port 13 of the peripheral wall of the cathode 1.” (“Constitution”) and “To supply stably a reaction gas and to form a uniform thin film

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by providing plural chambers..." ("Abstract"). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04). Additionally, it has been established that the shape of a container is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container is significant (In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (the configuration of the claimed disposable plastic nursing container was MPEP 2144.04).

Response to Arguments

3. Applicant's arguments with respect to claims 1, 3, 5, 6, and 9-12 have been considered but are moot in view of the new grounds of rejection.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (703) 872-9306. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.


8/9/5